

A sump is a below ground chamber (pit) that provides access to tank system components and, when contained, prevents liquids from releasing into the environment. Sumps may or may not be contained.



Overview

This training module covers recommended inspection guidelines and best management practices for sumps associated with your UST system. This module will:

- Help you identify and inspect the sumps associated with your UST system, including the equipment in your sumps.
- Explain some simple steps you can take to maintain your sumps and the equipment in your sumps, as well as identify potential problems.
- Provide you with tips for fixing common problems before they cause a release to the environment.

While this module addresses a number of issues related to sump maintenance, it may not cover some details specific to your particular sumps. Keep in mind the information provided in this module is not intended to replace or contradict your specific manufacturer's instructions for maintaining your sumps and the equipment in your sumps.

Regulatory Requirements - Sumps

Beginning in August 2012, every UST facility must conduct an onsite inspection every 30 days. The inspection must be performed by the designated Class B operator or by someone under the direction of the Class B operator. Access to sumps may be obstructed in winter months due to snow or ice. It must be noted on your monthly walk through inspection report when conditions prevent the inspection of sumps. Under dispenser containment (UDC) sumps require monthly inspections regardless of weather conditions.

For sumps, the UST operator inspection must document that all sumps including submersible pump sumps, under-dispenser containment sumps, automatic tank gauging sumps, interstitial monitoring sumps, spill buckets and other equipment sumps are intact and are properly maintained to be free of water, product, and debris.

All compliance and maintenance records must either be kept at the UST facility or a readily available alternative site. The records must be provided for inspection to the North Dakota Department of Health (NDDoH) upon request.

Regulatory Requirements - Sumps

The following checklist can be used to document your monthly walk-through inspections. A copy of the “[Monthly Walk Through Inspection Checklist](#)” is available on the NDDoH Underground Storage Tank Program website.



MONTHLY WALK-THROUGH INSPECTION CHECKLIST

North Dakota Department of Health

Division of Waste Management – Underground Storage Tank Program (Page 1 of 2)

Revision: 01/2012

Facility Name: _____ Facility Location Address: _____

Class B Operator Performing or Overseeing Inspection (print name): _____

Date of Inspection: mm/dd/yy)														
Release Detection System: Inspect for the proper operation of your release detection system and indications of potential leaks in the underground storage tank system(s).														
Spill Buckets: Ensure spill buckets are clean, in good condition, and empty of liquid and debris.														
Overfill Alarm: Inspect for proper operation.														
Fill and Monitoring Ports: Inspect all fill/monitoring ports and other access points to make sure that the covers and caps are secured and tightly sealed.														
Spill and Overfill Response Supplies: Ensure you have available on site appropriate supplies for cleaning up spills or overfills; i.e., an absorbent such as cat litter or floor dry.														
Dispenser Hoses, Nozzles, and Breakaways: Inspect for loose fittings, deterioration, improper functioning and signs of leakage. Call your tank contractor to repair obvious problems.														
Dispenser and Dispenser Sumps: Open each dispenser and inspect all visible piping, fittings, and couplings for any signs of leakage. If any water or product is present, remove it and dispose of it properly. Investigate and report to the North Dakota Department of Health reasons for the presence of product. Remove any debris from the sumps.														
Piping Sumps: Inspect all visible piping, fittings, and couplings for any signs of leakage. If any water or product is present, remove it and dispose of it properly. Investigate and report to the North Dakota Department of Health reasons for the presence of product. Remove any debris from the sumps.														
Impressed Current System: Inspect for proper operation and log your monthly impressed current readings every 60 days (volts and amps). Note: Facility operators need to determine if their UST(s) have an impressed current corrosion protection system and meet this requirement.														

Sample Site Map

All facilities should build or draw a site map that is readily available to clearly identify UST equipment such as all sumps, rectifiers and shutoff switches/breakers for the pump equipment.

Gas Pump Islands

Dispenser
Sump 1



Dispenser
Sump 2

Dispenser
Sump 3



Dispenser
Sump 4



Gas Pump Islands

Dispenser
Sump 5



Dispenser
Sump 6



Emergency Shutoff

Pump Sump 2

ATG Sump 2

Fill Sump 2

Pump Sump 1

ATG Sump 1

Fill Sump 1



Pump Sump 3

ATG Sump 3

Fill Sump 3

Regular 87
Tank 1

Super 89
Tank 2

Premium 91
Tank 3

Safety Considerations

If you perform sump inspection and maintenance activities, you should be experienced and aware of hazards and safety issues. Chances are you will be working in a high traffic area, such as a gas station. You should properly mark off your work area and take appropriate steps to protect yourself. You should have the following items:

- Safety barriers, such as traffic cones or yellow plastic tape to mark off your work area
- Orange safety vest
- Hard hat (for construction sites)
- Steel-toed boots
- First-aid kit

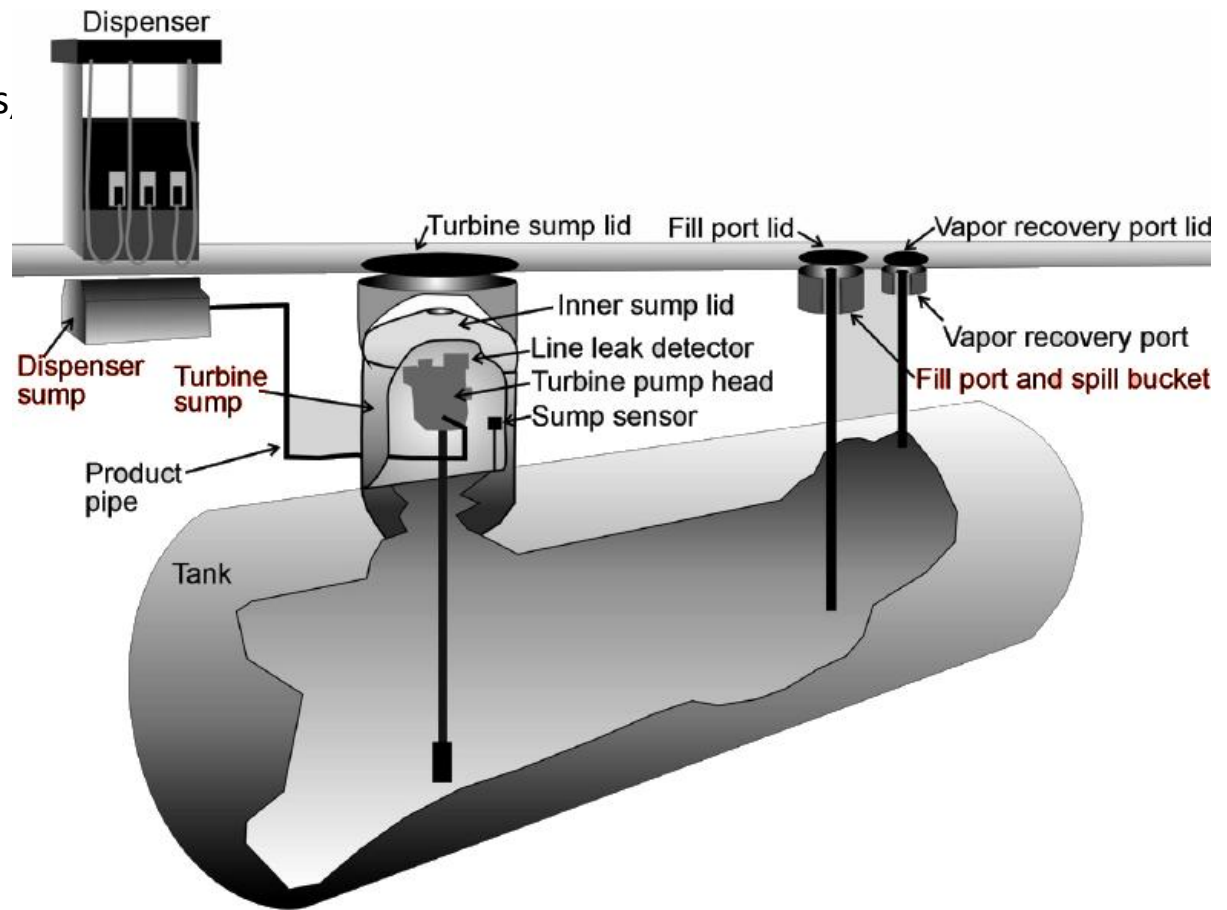
You should consider these additional safety precautions:

- Sump lids may be large and very heavy and may require more than one person to lift. Use caution when lifting large steel lids.
- Be aware of the possibility of explosive or harmful vapors when inspecting and maintaining sumps. Avoid breathing in petroleum vapors.



Sump Types

Sumps, including the sumps beneath dispensers, sumps around the submersible pump (turbine) head, transition/intermediate sumps, and spill buckets are common sources of leaks. Leaks of even small volumes of product can seep into the ground and contaminate soil and groundwater. Inspecting and maintaining your sumps is generally simple and can prevent or minimize such releases.



Sump Types

Sumps may or may not be contained. Contained sumps have sides and a bottom, are designed to be liquid tight, and may have a special cover designed to keep out water. Uncontained sumps generally do not have a bottom and are not designed to prevent liquid from entering or exiting the sump. These sumps may use wooden or metal sheeting to restrict the slumping of soil or crushed rock onto the equipment and to prevent the surface pavement from buckling or caving.



Contained Sump



Uncontained Sump

Sump Types

What Kinds Of Sumps Are Associated With My UST System And Where Are They Located?

The types of sumps likely to be associated with your UST system are: **turbine sumps, dispenser sumps, transitional sumps, spill buckets.**



Spill Bucket



Transition Sump



Uncontained Equipment Sump



Turbine Sump

Sump Types

Turbine Sumps

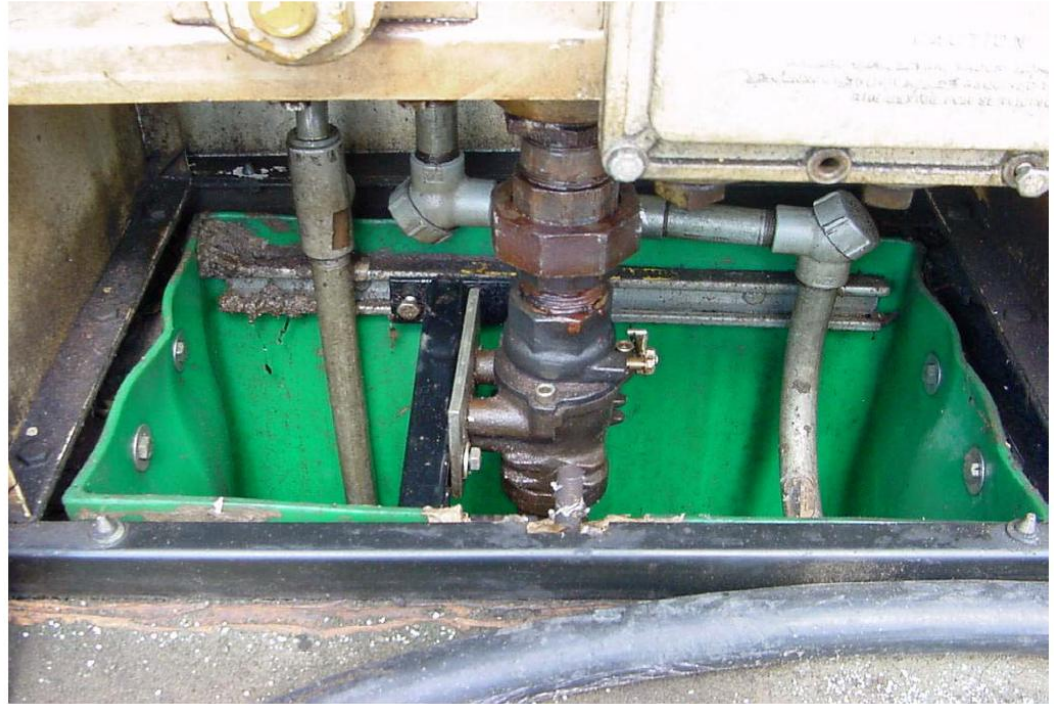
Turbine sumps are designed to provide access to the turbine area above the tank. The turbine area may house the submersible turbine pump head, piping, line leak detectors, interstitial monitoring devices, wiring, and other equipment. You generally will find turbine sumps directly above your USTs. Turbine sump lids generally range from 3 to 4 feet in diameter and can be round, oval, square, or rectangular in shape.



Sump Types

Dispenser Sumps

Dispenser sumps are designed to provide access to piping, flex connectors, shear valves, and other equipment located beneath the dispenser. Dispenser sumps are found directly under your dispensers.



Sump Types

Transition/Intermediate Sumps

Transition/intermediate sumps are less common than other sumps, but can be found along the piping runs that connect the tanks to the dispensers, and are designed to provide access to the piping. Transition sumps are used to transition from above ground piping to below ground piping or, in some cases, to transition between different types of piping. Intermediate sumps are located at key points in the piping system (e.g., low spots, branches, tees). Transition/intermediate sump lids generally range from 3 to 4 feet in diameter and can be round, oval, square, or rectangular in shape.



Sump Types

Spill Buckets

Spill buckets are contained sumps installed at the fill and/or vapor recovery connection points to contain drips and spills of fuel that can occur during delivery. Spill buckets are located where the delivery driver connects the product and/or vapor recovery hoses to your tank. Spill buckets can be found directly above your UST, at a location that is away from your UST (remote), or both. They typically range in size from 5 to 25 gallons, and lids range from 1 to 2 feet in diameter. Spill buckets may also be installed within a larger sump, similar in construction to a turbine sump, for secondary containment. In this case, you will only need to open your smaller lids to access the spill buckets.



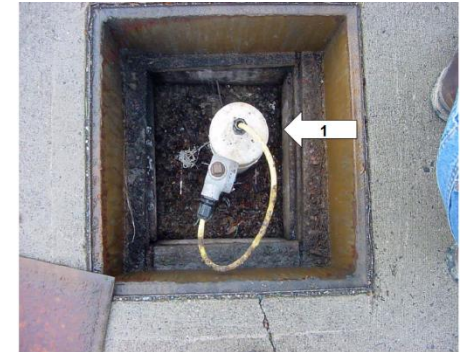
Sump Access

How Do You Access Your Sumps And Spill Buckets?

You may need tools such as a large screwdriver, pry bar, wrench, or hammer to open your sump lids. Composite lids may require a specialized tool that you probably have on site. Have someone help you in lifting large lids, as they may be very heavy. Use caution when opening the lids and be aware of the following:

- Square, rectangular or oval sump lids can fall through the opening and damage the piping, submersible pump or tank.
- Round lids, while not typically capable of falling into the sump, may swing down and damage the turbine head or line leak detector.
- If applicable, follow your equipment manufacturer's recommendations if special instructions are necessary to open the sump lids.
- You may need a key to remove the dispenser cover in order to access the dispenser sumps.

Generally, sumps will have a traffic load rated lid, beneath which may be either direct access to the equipment or, if contained, an inner lid covering the contained area.



Square steel sump lid pulled up to show the inside of an uncontained ATG sump



Circular steel sump lid pulled back to show the inner lid covering the turbine sump

Sump Maintenance

Maintaining your sumps and spill buckets will involve gaining access to them, inspecting them on a regular basis, assessing whether any problems exist, and ensuring any problems are addressed. For serious problems (e.g., obvious leaks occurring on the piping and equipment, cracked spill buckets or sidewalls, cracked or missing seal around the lid), it's best to contact your UST contractor or the manufacturer of your UST equipment to have the problem fixed.

Sump Inspection

What Should You Look For When You Inspect Your Turbine, Dispenser, And Transition/Intermediate Sumps?

Are The Lids Tight And Sealed Correctly? Check to ensure the lids to the turbine, transition and intermediate sumps create a tight seal when closed and are securely fastened. The seals of the sump lids often dry out, crack and require replacement; so you need to ensure they are in good condition. Water in your sumps may be an indication of a bad seal.

Are The Sump Walls Intact? Check to ensure the walls of your sump are intact and are not slumping or warping. If your sump is not contained, check the sidewalls to ensure there is no caving.



Contained turbine sump full of liquid

Sump Inspection

Is The Sump Free Of Debris, Liquid, Or Ice? Debris, liquid and ice can damage equipment, reduce capacity (if contained), and interfere with your equipment's ability to operate correctly. For example, water in your sump will reduce capacity and may cause metal equipment in your sump to corrode. Fuel in your sump will also reduce capacity and may damage some plastic sumps and other components not designed for long-term contact with petroleum. Similarly, used dispenser filters may contain small amounts of petroleum, so they should not be left inside your sump. You should carefully remove and properly dispose of any debris, liquid, or ice in your sumps.

Is The Sump Free Of Cracks Or Holes? Examine your contained sumps for signs of damage (e.g., cracks or holes). Check to ensure no cracks are present around the areas where components, such as wiring conduit and piping, enter your sumps. Cracks and holes mean your sump will no longer contain product or prevent releases to the environment.



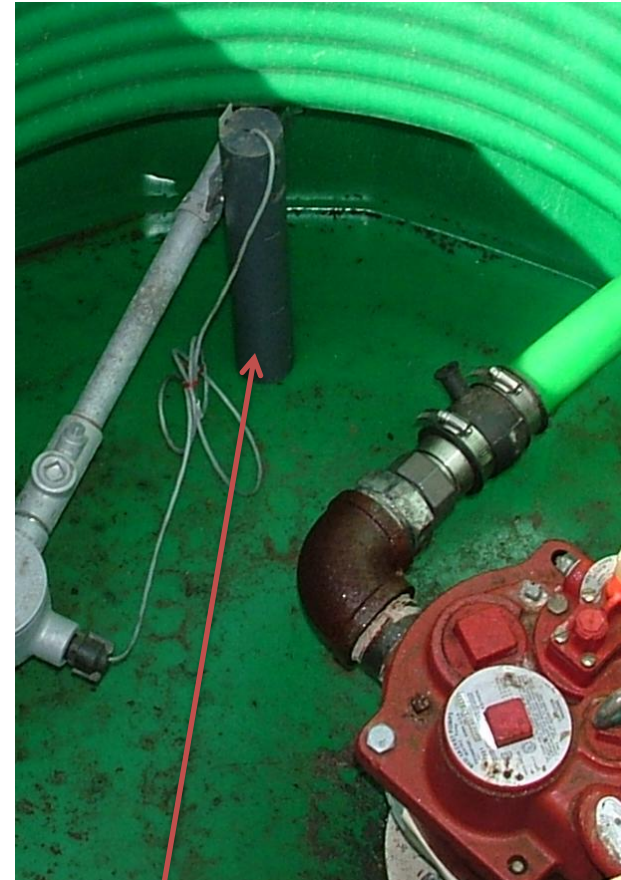
Dry, debris-free contained turbine sump

Sump Inspection

Are Sump Components Leak-Free? Check to ensure the piping, fittings and connections in your sump are not leaking or dripping fuel.

Is The Sump Free Of Staining/New Staining? Check to ensure no new stains are present since your last inspection. New staining indicates a drip or spill has occurred.

Are The Sensors Positioned Correctly? If you have sensors, check to ensure they are positioned properly in the lowest part of your sump and below the piping entry. Sensors should not be raised as the result of false alarms due to water or for any other reason. Raised or disabled sensors will take longer or fail to detect a leak and could violate regulatory requirements.



Sump sensor in contained turbine sump

Sump Inspection

Are All Penetrations Into The Sump In Good Condition? Check to ensure all areas where electrical wires, conduits and piping enter the sump are sealed. Cracked or loose seals around the penetrations can allow liquids to enter the sump and can allow fuel to be released into the surrounding soils if a release occurs inside the sump.



Sump penetration seals in poor condition



Sump penetration seals in good condition

Sump Inspection

Are The Test Boots Positioned Correctly And In Good Condition? A test boot is found on secondarily-contained piping and is a flexible sleeve usually made of rubber with a valve located either at the entry to the sump or on the piping in the sump. It is used to test the space between the inner and outer piping walls for tightness. Check to ensure the test boots are in good condition, not cracked or torn, and positioned correctly in the sump.

To ensure a leak can be detected by your leak detection equipment, test boots should be positioned so they allow product to enter your sump if a leak from the primary piping occurs. There are a variety of different configurations for test boots. If you are unsure of the appropriate configuration, check with your contractor.



Test boot located in a sump

Sump Inspection

Is The Piping And Other Equipment In Good Condition? Sumps may contain various types of piping and equipment such as leak detection equipment, turbine motors, line leak detectors, sensors, conduits, and flex connectors.



This is an example of what you don't want to see. Water in the sump. Notice that even the stainless steel flex connector is rusting.

Sump Inspection

When inspecting the piping and equipment in your sumps, you should watch for the following conditions:

- For metal piping, check to ensure the piping is not severely corroded, in contact with the ground if it does not have corrosion protection, or otherwise degraded.
- For fiberglass piping, check to ensure the piping is not cracked, delaminated, or otherwise degraded.
- For flexible piping, check to ensure the piping does not have abnormal bends, breaks, cracks, or kinks; is not bulging, swelling or growing; has not become soft, spongy or discolored; and is not otherwise distorted or degraded.
- Check to ensure the fittings and flexible connectors are not twisted or misaligned and the flexible connectors are not cracked, kinked, etc.
- Check to ensure other pieces of equipment, including pump head, line leak detector and sensors, are not visibly damaged, severely corroded, etc.



Corroded metal piping



Flexible piping is cracked

Sump Inspection – Spill Bucket

Are The Lids To Your Spill Buckets In Good Condition? Check to ensure the lids to your spill buckets are in good condition so they will keep water out when the lid is closed. Ensure that when the lids to your spill buckets are in the closed position, they create a good seal and are secured tightly. Some spill buckets contain a rubber gasket inside the cover; check to ensure the rubber gasket is in good condition and creates a proper seal when the lid is closed.

Check to ensure the lid is not touching the fill cap. This situation should be repaired because it could potentially damage the fill pipe and the tank if it is in an area where vehicles drive over the lid.

Sump Inspection – Spill Bucket

Is The Spill Bucket Free Of Debris, Liquid, Or Ice? Examine your spill buckets to determine whether they contain debris, liquid or ice. For example, water in your spill bucket will reduce capacity and may cause metal equipment in your sump to corrode. Fuel in your spill bucket will also reduce capacity and may damage some plastic spill buckets not designed for long-term contact with petroleum. You should carefully remove and properly dispose of any debris, liquid or ice found in your spill buckets during your inspections. You should also check for and remove any liquid and debris present in your spill buckets before and after every delivery.

